

EXPERIMENTAL FEEDING PATTERNS IN THE AMERICAN AVOCET

(Recurvirostra americana)

submitted by

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## PREMIGRATORY FEEDING PATTERNS IN THE AMERICAN AVOCET

Relatively little is known about the behavior of the American Avocet.

Based on non-critical observation, one often gets a stereotyped view of various behavior patterns in animals and the feeding habits of the American Avocet fall into this category. They are characterized as walking along in water, swishing their bill side to side stirring up the muddy bottom then eating the discovered prey.

However, in my early observations, I noted that the Avocet was also seen walking through the water and picking or making jabs into the water and picking or eating as it went. On two occasions I noticed an Avocet actually hawking after flying insects which I thought was rather peculiar. I decided then to try to find out specifically in what ways the Avocets feed, characterize each method and determine the type preference and success. Additionally I was interested in determining the diurnal pattern at least in a rough way.

The project site was a small lake about 0.5 miles long by 0.25 miles wide, starting near the north side of the road leading to the 00 Ranch from Highway 205. It is roughly six miles from the 00 Ranch and 13 miles from Highway 205. The lake is bordered on both sides by Grease-wood covered sand-dunes and some sage. It is temporary highly alkaline lake that was probably not more than 6 inches deep with the deepest portion on the east side of the lake and sloping very gradually up ward to the west.

### METHOD:

I spent about 6 hours on two different days just familiarizing myself with the lake site and the general feeding and roosting sites of the Avocets. I noted that there were from 95 to 135 avocets on the lake at any given time. I chose a protruding sand-dune roughly half way between their roosting spots and nearly central to the feeding area.

I used a stop watch, 7 x 35 binoculars, and 20x spotting scope. On Sunday, July 2, I spent eleven hours from 8:00 A.M. to 7:15 P.M. in detailed study. First I observed the various feeding methods, then I recorded observation on how many steps per minute, how many swallows in 50 jab attempts, how many steps between jabs, how many

steps before raising head, how many swallows per minute and finally every half hour I would scan as much of the lake as I could see, about 95%, and recorded how many birds were using each type of feeding pattern and how many birds were not feeding. Those that were not actively feeding included activities such as preening, standing, or sleeping either in or out of the water. I counted only those actively feeding as feeding.

A swallow was counted when a bird would raise its head and make a gulping motion.

#### RESULTS:

I noted that there were three types of feeding methods. Type I was characterized by the birds walking around in a fast fashion, rather random in direction, and making jumps at the prey species on the bottom. In other words, they were visually sitting the prey then making a stab at it. This method was confined to the west side of the lake where the water came just over their ankles or not more than one inch deep. The birds tended to feed singly or in small groups of 2 to 4. When a prey was caught the bird would raise its head to swallow it.

Type II was the traditional style where the birds walked along the water with their bill in the water making sideways sweeps to stir up the bottom then when something was spotted, there was quick hawking motions with the bill in the water to capture it. If successful, they would raise the head to swallow. However, sometimes they would raise their head just to look around.

Type II was seen on all parts of the lake but only sparingly on the shallow west side. It was most common up the center and on the east side, where the water varied from mid tarsus to near the top of the femur. Some birds in the deeper portion would stick their heads and even their whole necks under water.

Birds using Type II were often single or in small groups, but more often they would be in large groups of from 10 to 60 birds. When in the large groups they tended to all face the same direction and go back and forth as a group, quite close together in a long line sideways shoulder to shoulder or head to tail and about

four birds wide.

There was a third type, Type III, which was really just a slight variation of type Ia. This method was confined entirely to the west and north ends where there were areas where grass grew out into the lake. Here prey was often picked off of the surface of the water or out of the grass. This area probably had a different prey species.

Types I and II I considered major methods because of time and numbers of birds involved, and type III was only a minor method which never had more than 10% of the feeding birds involved (see graph I). As a matter of fact it was not noticed until 4:00 P.M.

During the time that I observed the Avocets, the peak feeding periods came at mid morning (9:00) and late afternoon and early evening (3:00 to 7:00), when over 70% of the population was feeding. Type II was always the major method varying from 54.6% to 100% of the feeding birds, however, during the peak feeding periods the birds diversified to include types I and III. Type I reached a peak of 40% at 5:00, the middle of the afternoon and evening feeding session. From 10:30 to 8:30, 100% of the feeding birds were using type II. However, during this time the feeding birds dropped to 8% of the total population at 1:00. The majority of the Avocets were either sleeping or preening at the two roosting sites on the lake (see the map).

Avocets using type I averaged 37.7 jabs per minute out of 10.5 minute timings; 26.2 swallows in 30 jabs from 10 trials of 50 jabs each, which gives an average of 52.4% successful attempts; and an average of 19.75 swallows per minute (from ten - one minute timings). They also took an average of 2.05 steps per jab, or 77.3 steps per minute.

Avocets using feeding method type II took 112 steps per minute average from ten - one minute timings with 18 swallows per minute average from ten one minute timings. They raised their head from the water every 4.76 steps, averaged from 435 steps with 102 head raises. This amounts to raising the head 23.53 times per minute and swallowing 76.6% of the times the head was lifted.



#### INTERPRETATIONS:

It is relatively simple to determine the efficiency of the type I feeding method because one can count the number of jbs and the number of swallows in a given time, although sometimes when they were facing the other direction it was somewhat hard to tell. In this study it turns out to be 52.4% successful attempts. However, for those using type II it is not so simple because it is hard to determine when an attempt is being made to capture food, because the bill and sometimes the whole head and neck are under water. If one assumes that they raise their head after every attempt, successful or otherwise, then in my observations this would mean an efficiency of 76.6%. However, I don't feel that I can reliably make that assumption. Yet, there are other ways to compare the two major feeding types.

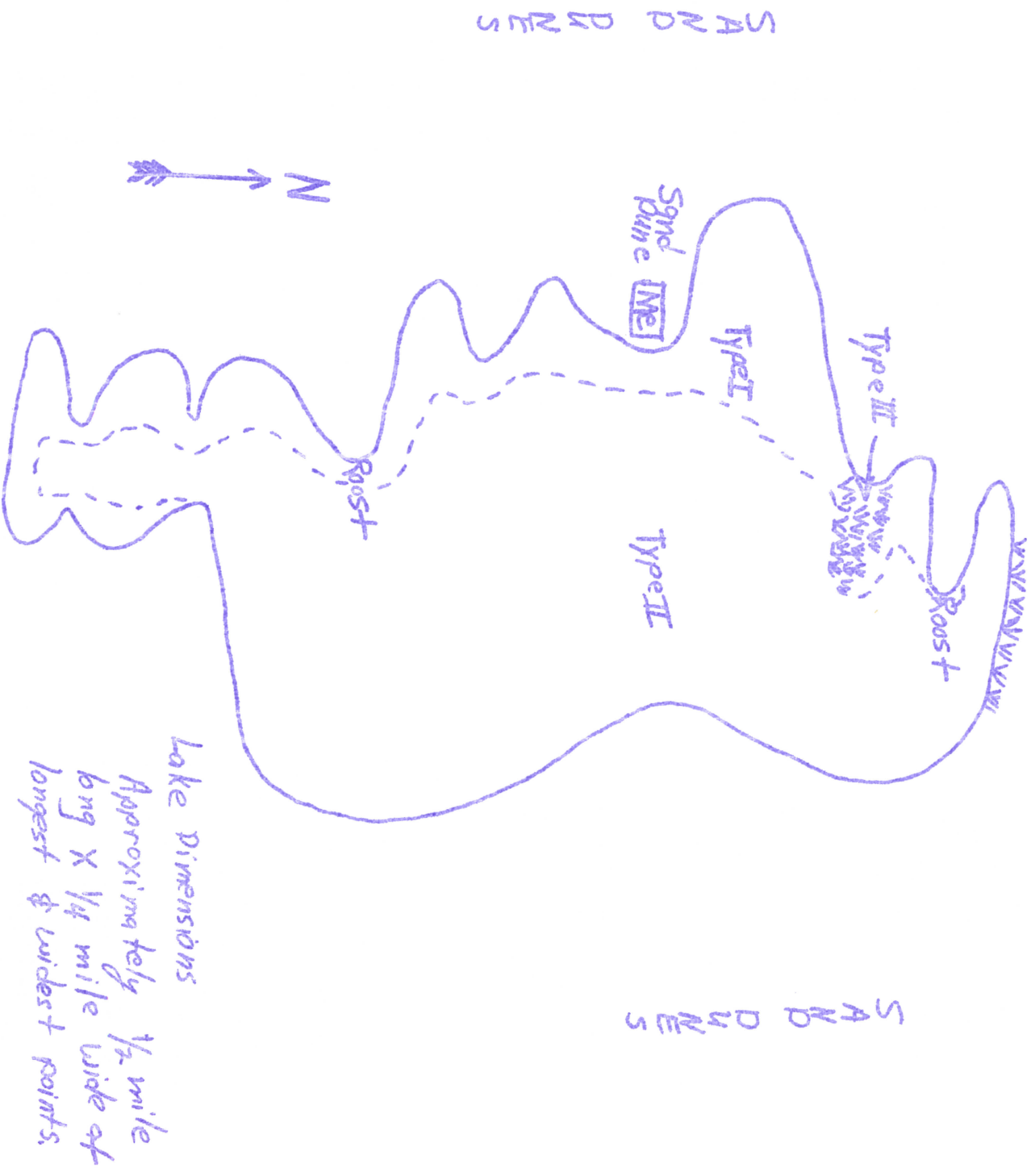
If we assume that their steps average equal length between the two types then we can see that those using type II cover nearly 32% more territory than those using type I in a given period of time, yet, they make on the average only 18 captures per minute. Those using type I make 19.75 captures during the same time. This would seem to imply that type I was the much better method.

Because of the uniformity of the lake, I assume the prey species to be the same for both types, although I have no evidence for this assumption and such evidence should be obtained. If this were so and if type I is a more efficient method, then it makes one wonder why type II is so highly preferred over all other types observed. Possibly there is a difference in the prey species, or maybe there is just a difference in the size of the prey taken so that type II is really the more efficient method. Type II may be preferred because of the instinctive behavior pattern brought about by the evolution of the bill which is well designed for that technique. From time to time there were Wilson's Phalarope feeding around the edge of the lake, as many as forty, and this may have provided some competition since they were feeding in a method similar to type I. However I have no proof of this.

Because of the habitat and low percentage using type III it can be assumed that there might be a prey species difference and it may also be less efficient, but because it is only used during the peak feeding period it might be possible that the feeding spaces are saturated forcing some into this other type. This also needs to be studied in more detail.

This study has shown that there is a distinct diurnal feeding pattern with peaks in the morning and late afternoon, with a resting- preening period inbetween; and there seems definitely to be a feeding method preference to type II over type I even though type I seems to be a more productive technique. I will admit that based on my limited observation time, what I have shown may be erroneous. Definitely more time should be put into a study of this type.

# Map of Project Site



Lake Dimensions  
 Approximately  $\frac{1}{2}$  mile  
 long X  $\frac{1}{4}$  mile wide at  
 longest & widest points.

← 6 miles to CORRACH 13 miles to Hwy 205 →

# FEEDING CENSUS

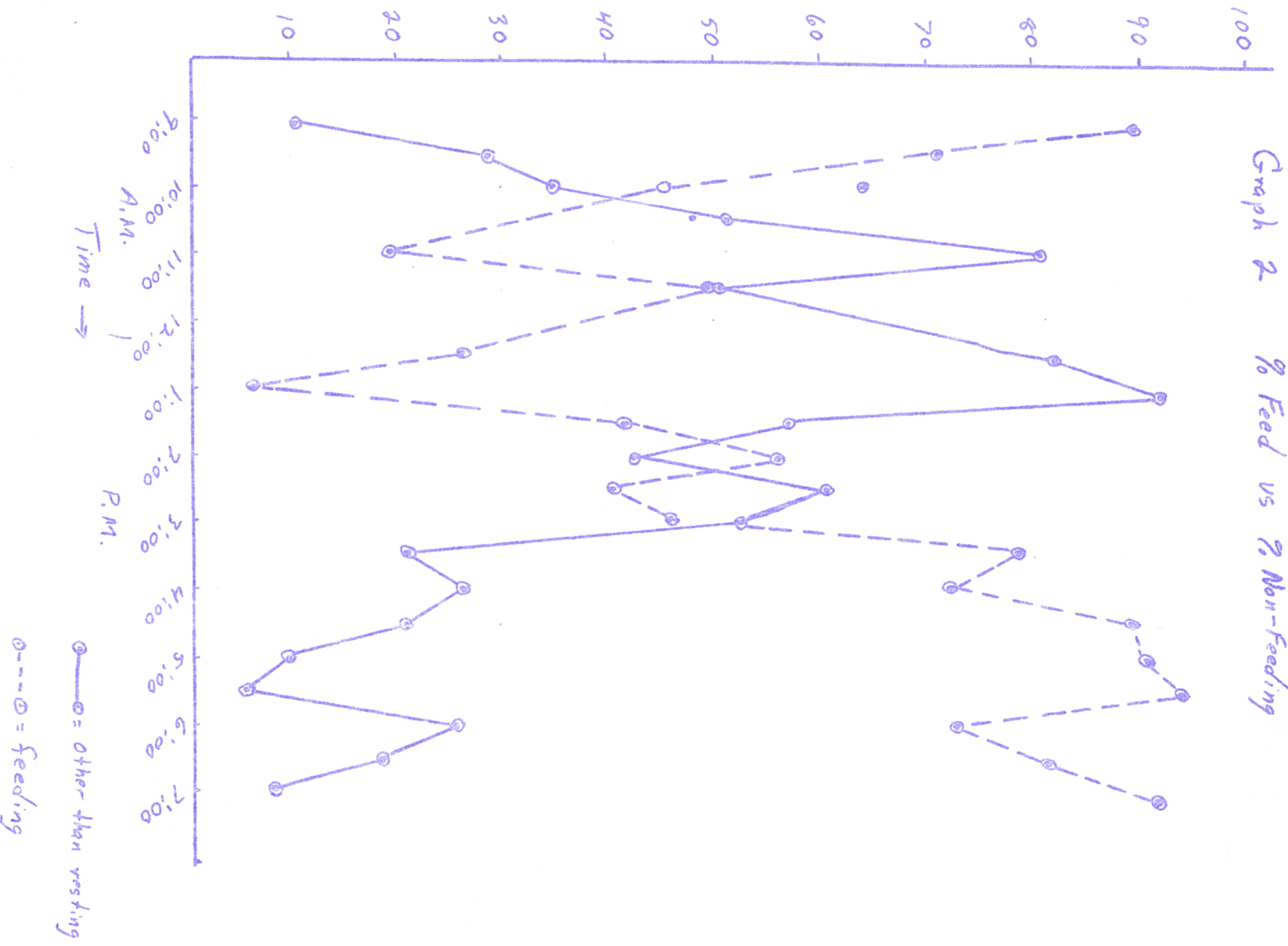
<u>Time</u>	<u>#</u> <u>Type I</u>	<u>%</u> <u>Type I</u>	<u>#</u> <u>Type II</u>	<u>%</u> <u>Type II</u>	<u>#</u> <u>Type III</u>	<u>%</u> <u>Type III</u>	<u>Total</u> <u>Feeding</u>	<u>%</u> <u>Feeding</u>
8:00	11	11.1	83	88.9	0	0	99	89.2
9:30	14	19	60	81	0	0	74	71.9
10:00	2	2.4	33	97.6	0	0	35	64.9
10:30	0	0	50	100	0	0	50	43
11:00	0	0	22	100	0	0	22	19.3
11:30	0	0	60	100	0	0	60	49.1
12:00	--	--	--	--	--	--	--	--
12:30	0	0	28	100	0	0	28	26.6
1:00	0	0	8	100	0	0	23	26.6
1:30	0	0	53	100	0	0	53	42.8
2:00	0	0	74	100	0	0	74	56.5
2:30	0	0	40	100	0	0	40	41
3:00	0	0	50	100	0	0	50	46.3
3:30	0	0	64	100	0	0	64	88.1
4:00	17	24.2	53	75.8	0	0	70	73.4
4:30	17	19.9	60	69.7	9	10.4	86	83.9
5:00	40	40.4	54	54.6	5	5.0	99	90.8
5:30	25	21	93	76.1	1	0.9	119	94.4
6:00	9	10.7	74	88.1	1	1.2	84	73.7
6:30	8	8.2	89	90.8	1	1.0	98	81.2
7:00	6	5.6	100	93.5	1	0.9	107	92.3



## CENSUS TABLE continued

<u>Time</u>	<u>Other than feeding</u>	<u>% Other</u>	<u>Total Birds</u>
8:00-12	10.8	111	
9:30	29	28.1	103
10:00	46	35.1	131
10:30	55	52	105
11:00	92	81.7	114
11:30	62	50.9	122
12:00	-	-	-
12:30	87	83.4	105
1:00	114	93.5	122
1:30	71	57.2	124
2:00	57	43.5	131
2:30	62	61	102
3:00	58	53.7	108
3:30	18	21.9	82
4:00	25	26.6	95
4:30	23	21.1	109
5:00	10	9.2	109
5:30	7	5.6	125
6:00	30	26.3	114
6:30	22	13.8	117
7:00	9	7.7	116

Graph 2 % Feed vs % Non-Feeding



Graph 1 % of Feeding Birds Utilizing each Method.

